DOCUMENT RESUME

ED 112 857 IR 002 566

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TITLE A Simulation Model and Data for Library Planning.
INSTITUTION Washington State Library, Olympia. Library Development Div.
PUB DATE 10 Jun 75
NOTE 91p.

EDRS PRICE MF-$0.76 HC-$4.43 Plus Postage
DESCRIPTORS Bookmobiles; Computer Oriented Programs; *Cost Effectiveness; Delivery Systems; Flow Charts; Futures (of Society); Library Collections; Library Expenditures; Library Facilities; *Library Planning; Models; Public Libraries; Rural Areas; *Simulation; State Libraries; Statewide Planning
IDENTIFIERS Mail Order Book Delivery; Washington

ABSTRACT

The Library Development Division of the Washington State Library and the Library Futures Planning Task Force developed cost data and a computer simulation model in order to construct a series of alternatives for extending library services to areas of the state now unserved. User needs were assessed, and cost data were developed for mail-order delivery, bookmobiles, and new library facilities. A flow chart of the simulation model was constructed, and the sensitivity of the results of the simulation to changes in data were analyzed. Specific cost data is included for facilities, bookmobiles, maintenance, collections, and staffing. (Author/LS)

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A SIMULATION MODEL AND DATA FOR LIBRARY PLANNING

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June 10, 1975

Olympia, Washington
Washington State Library

IR 002 566

ABSTRACT

This document is the final report on a research project undertaken for the Library Development Division of the Washington State Library and the Library Futures Planning Task Force. The objectives of the project were to develop cost data and a computer simulation model, and then to use the data and the model to construct a series of alternatives for extending library services to areas of Washington now unserved, and to provide the cost of each.

This document contains cost data developed for mail-order delivery, bookmobiles, and new library building structures. The sources of the data, along with the nature of the data, are described, a flow chart of the simulation model is provided, and a discussion of the sensitivity of the results of the simulation runs to changes in the data is included. The interested reader is referred to a complete printout of the simulation runs that is available at the State Library or from the Principal Investigator.

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INTRODUCTION

May 27, 1975

In April, 1974, the Library Futures Planning Task Force was officially formed to pursue the development of a state-wide system of public libraries. The Task Force had responsibilities for providing leadership in the orchestration of the planning/implementation process under way. This process was targeted at a maximization of library/information-services for the people in Washington State.

As the implementation of existing plans took place it was evident that an integration of programs was essential between municipal public library programs, district public library programs, and in some cases library/information-service programs outside the public library realm were involved in providing public library type services. Further, it was essential to examine the wide variety of alternatives available for the provision of service--services through materials by mail, bookmobile, telephone reference services, many small service outlets in rented facilities, and on it went. Besides looking at the alternatives for the provision of service it was necessary to examine the impact of time on developing these services singularly or in tandom with other service strategies--time has impact because of inflation, efficiencies of scale realized by size of service, sequencing of events relative to the provision of service, cost of continued planning and existing services that may be curtailed because of current fiscal limitations.

Hundreds of data units about library service needed to be examined in mathematical combinations that amounted to the thousands. It was necessary to speculate about the future based on what we knew of the

present. A sophisticated tool to allow for the analysis of data related to the planning for and provision of library/information-service was necessary. SIMULATION was identified as such a tool.

The objective held by the Task Force was to develop a simulation model, based on an integrated state-wide system of public libraries, that would allow for study of the many questions being faced. Analysis of the many "what if" type of questions was necessary. What if we provided bookmobile service in this unserved community plus materials by mail. What if we provide materials by mail in this rural area even though there is a city here with a minimum collection. How much would it cost? Which is more costly? What if we held off on starting our bookmobile service for two years but had full service in six--would we save money over starting it now and having full service in six years? Examination of state-wide services was essential. The state-wide perspective was necessary as local programs were studied.

As the simulation proposal was developed the Library Futures Planning Task Force held the concept that looking at the State as an integrated whole (the sum of all of the parts) was the strategy that would lead to state-wide services. Looking at the State in this manner required that local planning/implementation teams fully utilize the processes of extrospection--viewing of the local program in the light cast by the external source (viewing the local program as it builds towards the total state-wide program).

The simulation model was developed, as is reported in this document, to facilitate state-wide programs development based on local service. Field testing of the model--and its actual utilization for planning integrated

state-wide services--has not occurred. Early in 1975 the conceptualization of how to develop maximized library/information-service for the people of Washington shifted from the orchestrated state-wide concert approach to one that focused on independent local developments that would then build into a state-wide system of public libraries. Both strategies could attain the same goals.

Our new tool has been developed. The simulation model has been designed in a way that allows for the necessary modifications to be made to make it applicable to a wide variety of settings. By changing from one that will analyze state-wide questions to one that will be useful at the regional or even city level. As the simulation model is utilized in the future the full power of this new tool for library programs in Washington State will be determined.

We now place this simulation model, this tool for planning and implementing library/information-services for people in Washington State, on the shelf. It is placed there to be ready for use with the other tools available that will facilitate our efforts at the maximization of library services. This tool is to be used--it appears to be usable.

Gerald R. Brong, Director
Library Futures Planning Task Force
Library Development Division
Washington State Library

II. DESCRIPTION OF RESEARCH OBJECTIVES, METHODOLOGY, AND ASSUMPTIONS

The work reported upon this document is that done under a research contract agreed upon between the Washington State Library, Washington State University, and the Library Futures Planning Task Force, the principal investigator for which is C. B. Millham. The objectives of the work done included the following:

(a) To run a survey of library patrons across the state in order to determine patterns of library usage, circulation patterns, and levels of patron satisfaction with library services.

(b) To develop cost data useful in determining costs of various alternatives for extending library services to parts of the state that are presently unserved or underserved.

(c) To develop an appropriate computer simulation model that would provide a management tool to assist decision-makers in determining the cost of each of a number of mixes of alternatives for library service extensions over a six-year planning horizon beginning July 1, 1975. The horizon was suggested by the State Library and the Library Futures Planning Task Force.

(d) To implement the computer simulation model, utilizing the data developed under part (b) of the research project, and provide the Library Futures Planning Task Force and the Washington State Library with demonstration mixes of alternatives in appropriate regions and the cost of each mix. As a corollary, information regarding the extension of services outside these regions is also provided herein, although this was not specified in the contract and is not regarded as a major objective of the project.

Simulation

Computer simulation of a real-world process can be defined as the construction of an analog model of the process, utilizing the capability of the computer for rapid computation in order to learn and study about aspects of the problem at hand. Normally, the simulation model will consist in large part of a series of mathematical expressions that purport to describe relationships between problem components. The model will be good or bad according as the hypothesized mathematical relationships are valid or invalid. If the model is valid, it will be useful provided the data upon which it operates is accurate. The model developed during this work is deterministic, as specified by contract, as opposed to stochastic, or possessing statistical components represented by the use of random number generators. Lack of certainty in the data is then handled through a number of sensitivity studies on the model parameters.

The Research Team

The credentials of the investigators are the following. C. B. Millham holds the M.S. degree in Mathematics and the Ph.D. in Economics and is professor of Computer Science and Mathematics at Washington State University. He has co-authored a graduate-level text that has been translated into four languages, and has a number of publications on applied problems that involve the integration of economic data and economic considerations into mathematical and computer models in order to obtain answers and provide recommendations. He has been or is now the principal or co-principal investigator on several Federal grants and has served as consultant on a number of others. Norman Green holds the Ph.D. in Plant

Pathology. with publications in that area, and was asked to serve as a Post-Doctoral Faculty Associate on this project because of his experience and background in developing sound scientific data.

A Basic Assumption

An underlying assumption that has impacted heavily on parts of the work is that of a coordinated state-wide service, supported and aided by state funds. This assumption, made at the time the contract was negotiated, is of relevance because, for example, Federal Postal regulations mitigate against unaddressed mailings to city postal routes unless the mailings arise out of a governmental service. (See (25): Instructions for Mailers, U.S. Postal Service, p. 122, 412.) The absence of this assumption would render irrelevant much of the work having to do with mail-order delivery (MOD) centers in the western part of the state. It would also have impact in incorporated towns in Simulation Regions I and II, although, of course, it has no impact on the simulation model itself. Also, other data elements (personnel salaries, book processing costs, copier costs, supplies, telephone, and book stock purchases for MOD) are based on state-wide service cost assumptions.

It is also proper to observe at this time that the results of the survey undertaken in part (a) of the work did not have statistical significance, due to a low rate of response. Since a report on the survey has been made in another document, there will be no further mention of that aspect herein, and the recommendations regarding book collections for new facilities that had been planned will not be made.

There has also been no effort to inquire into the adequacy of existing library services. The investigators do not possess the competence

to do so, and in any case, it would not have been possible within the constraints of the project.

It is also worth mentioning that the work done has been heavily influenced by two documents. The work Study for the Design of an Optimum System for Mail Order Book Delivery in the State of Washington (23) has dealt thoroughly and exhaustively with mail-order delivery to rural areas, and that work is not duplicated herein. Secondly, the recommendations made in the unpublished, unsigned report Suggested Facilities Plan for Timberland Regional Library (24) were, with the permission of the Washington State Library, taken as applicable and used to determine the nature of new facilities in the unserved areas.

Regional Definitions and Services

It has been proposed that Washington State be divided into nine regions as shown in Figure 1. This study has used this regional proposal throughout, but it should be readily adaptable to other systems as deemed necessary.

A part of the study had to do with defining the types of library services that could be made to unserved areas and the costs involved in each instance. The study investigates three methods by which library services can be made available to users: mail-order delivery of books requested from regularly distributed catalogs to rural and small-town residents and confined persons; bookmobile service; and permanent structures, well-stocked and staffed, located in populations sufficiently large to provide patronage. Each of these three library delivery systems is costed in this document, and the cost data developed is utilized in the

Figure 1

PROPOSED REGIONS IN THE STATE OF WASHINGTON
AS PROPOSED BY
THE WASHINGTON STATE ADVISORY COUNCIL ON LIBRARIES

Region	
1	Clallam, Jefferson, Grays Harbor, Mason, Thurston, Pacific, Lewis
2	Wahkiakum, Cowlitz, Clark, Skamania, Klickitat*
3	Kitsap, Pierce
4	King
5	Whatcom, Skagit, San Juan, Snohomish, Island
6	Kittitas, Yakima
7	Okanogan, Ferry, Chelan, Douglas, Grant
8	Benton, Franklin, Walla Walla, Columbia, Garfield, Asotin
9	Whitman, Adams, Lincoln, Spokane, Stevens, Pend Oreille

*Klickitat County was split in the Washington State Advisory Council on Libraries proposal between Region 2 and Region 6. This report placed it in Region 2 where it is presently located.

computer simulation model, which is explained much later. Store-front facilities and rentals were not investigated because the availability and/or cost of such a possibility could not be ascertained with any degree of certainty over the planning horizon. This does not, of course, mean that these are not viable options, but only that hard data could not be guaranteed. The model itself focuses on two regions, one in the north-eastern part of the state, the other around the Olympic peninsula. Alternatives are analyzed by the model, and printouts are provided herein of the computer analysis. The analysis of the rest of the state is conducted without computer assistance, as the alternatives to be considered are, by and large, relatively clear and few in number. The document then proceeds with the presentation of cost data. MOD service is proposed for all addresses outside towns with existing library services, confined persons, and those requesting service. All cities and towns with existing "adequate" library facilities are excluded. Bookmobiles are proposed to provide library service where rural populations are sufficiently dense. In most areas of the state lacking library service (no county or regional system), one to three towns probably should have either bookmobile service or a permanent structure. It was the opinion of the authors that a bookmobile should be utilized to provide more personalized service where a bookmobile is available and service can be extended with minimal additional cost. In addition, all proposed new bookmobile locations could be initiated using bookmobiles presently available within the state.

The development of permanent structures is deemed necessary for all towns of 900 or more population which do not have libraries or where it is clear that existing library buildings must be replaced. (The number

is based upon the recommendation in the Timberland document (see (24), p. 6) that all towns of 1,000 or more have such a facility; the modification to 900 occurred because the only town affected by the change is Quilcene, which is between 900 and 1,000 in population.) Some extremely isolated towns with populations under 900 are also considered as special cases for permanent structures. Building costs used in this study are being restricted to factory-built prefab or modular units. See Appendix A for some details of the building.

Following the presentation of the cost data come recommendations for service extensions state-wide minus the two simulation regions, and finally, the simulation model is discussed and the results of numerous runs presented.

III. THE DERIVATION OF COST DATA

A. Bookmobiles

A survey of the available literature (7,1) revealed projected bookmobile operating costs that varied by as much as tenfold. For this reason it became necessary to develop the data anew. Accordingly, cost data was gathered by mail and telephone survey of the eleven county and regional libraries in Washington that operate bookmobiles.

They are:

Ft. Vancouver Regional Library
King County Library
Mid-Columbia Regional Library
North Olympic Regional Library
Pierce County Library
Sno-Isle Regional Library
Spokane County Library
Timberland Regional Library
Whatcom County Library
Whitman County Library
Yakima Valley Regional Library

A total of 22 bookmobiles were surveyed and used in the development of the cost figures. The bookmobiles surveyed varied in age from four to nineteen years with the median age eleven years. Miles per gallon of gasoline obtained by these bookmobiles are given in Figure 2. At the present $.55/gallon of gasoline the cost of gasoline per mile is $.091 (using the mean value). Other variable costs per mile (oil, lube, tires, repairs, etc.) are given in Figure 3. Using the mean (average) of $.10/mile (based on 1974 costs), the total variable costs for the bookmobiles is calculated to be $.191/mile.

The staff requirements for bookmobiles varied somewhat between the libraries contacted. However, the large majority had a staff composition as shown in Figure 4. Salaries varied only slightly between the libraries

Figure 2

MILES PER GALLON OF GASOLINE FOR BOOKMOBILES AND COST PER MILE

	Range	4.4-8.1
	Median	6.00
	Mean	6.04
(a)	Cost per mile @ $.55/gallon	$ .091

Figure 3

OTHER VARIABLE COSTS FOR BOOKMOBILES*, PER MILE

	Range	$0.03-$0.17
	Median	$0.08
(b)	Mean	$0.10
(c)	Cost per mile, operating total (a+b)	$0.191

*All maintenance, lubrication, tires, and repair costs included.

surveyed and the salaries shown in Figure 4 are an average of the salary scales provided by these libraries.

Replacement of an existing bookmobile with a new (30 ft.) bookmobile from the Gerstenslager Co. would cost between $35,000 and $40,000 (telephone communication, Gerstenslager Co.). However, an alternative to purchasing a new bookmobile is to completely rebuild an existing bookmobile. An estimate of $3,600 - $4,000 was given to rejuvenate Timberland Regional Library's vehicle #5 (personal communication, L. Morrison). The indications were that this bookmobile was in need of substantial work, and that other refurbishing efforts on other vehicles would probably not be much more extensive. The figure of $4,000 was therefore used in the simulation model as an overhaul figure.

Other Considerations

Administrative overhead expenses, estimated at about 15% of the staff and operating costs of the bookmobile (personal communication, K. Coomes) are not included in the cost figures. Similarly, amortization costs are not included because these are to a large extent a function of the means by which the bookmobile is financed and the interest rate applicable, if any. The simulation model assumed outright purchase of any new bookmobile included.

Figure 4

STAFF COSTS PER BOOKMOBILE

Classification	
Librarian	$10,000 per year
Clerk Driver	7,200 per year
Clerk I	5,200 per year
Benefits @ 20%	4,430 per year
TOTAL	$26,880 per year

Figure 5

ANNUAL BOOKMOBILE OPERATING COSTS, EXCLUSIVE OF AMORTIZATION, OVERHEAD, BOOKS, AND HOME BASE SPACE

5,000 miles	(955. + 26,880)	$27,835.00
7,000 miles	(1337. + 26,880)	$28,217.00
10,000 miles	(1910. + 26,880)	$28,790.00

B. Building Costs

A standard modular unit, factory-built, of 2,500 square feet, including a meeting room of several hundred square feet, is assumed wherever a new structure is indicated. Again the Timberland document (1), plus conversations with knowledgeable persons, was used to determine the nature of the structure.

The Pierce County Library is presently planning a 2,000 sq. ft. modular library at Bonney Lake, Washington. Most specifications for this building (as put out for the bid) are given in Appendix A. Since this building data is the most current available, the bids received provided the basis for permanent structure cost figures for the basic building of 2,500 sq. ft. Costs for the furnishings, shelving and miscellaneous items necessary were obtained from the recently-completed (November, 1974) 2,500 sq. ft. South Mason County Library in the Timberland Regional Library System. These are itemized in Appendix B. The estimates of foundation costs were obtained from Lacey Construction Co., Pullman, Washington. Book costs are based upon the Timberland book collection at the 1973 discount prices, and staff costs are based upon conversations with State Library personnel and members of the Library Futures Planning Task Force (private communication, D. Cutler and J. Brong).

The foundation cost estimate obtained from Lacey Construction Co. was $2,000 for 2,000 sq. ft. building ($1.00/sq. ft.), based on the assumption that the site is level and requires minimum preparation. The structural materials (concrete and steel) costs are fairly constant regardless of location. Variations in cost would therefore be due primarily

to labor costs for site preparation which, until actual site selection is made, are not attainable.

Bids received January, 1975, on the Bonney Lake building (specifications in Appendix A), were $33,794; $39,100; $40,400; $40,994; and $65,416. A basic figure of $40,000 was therefore used for a 2,000 sq. ft. unit ($20/sq. ft.). The cost of shelving, furniture and miscellaneous items at the Timberland South Mason Library was $9,618.72, but some items were not purchased since they were available from existing stock. Projected costs of shelving, furniture and miscellaneous were therefore set at $12,000 for a 2,500 sq. ft. building (L. Morrison, personal communication). The book collection and costs are given in Figure 6 and the costs of a library are shown in Figure 7, as projected to the 2,500 sq. ft. modular unit envisaged in this study. Some considerations of land costs are provided in Appendix F, and a list of manufacturers of modular units in Washington is provided in Appendix C.

Figure 6

LIBRARY COLLECTION COMPOSITION AND COSTS (1973) 1974*

Categories	% of Collection	Cost per Book
Adult non-fiction	40	(12.00) 13.44
Adult fiction	24	(5.75) 6.44
Children's fiction	24	(4.00) 4.48
Children's non-fiction	12	(4.00) 4.48
Processing costs after purchase		2.30
Magazine and newspaper subscriptions, records, and cassettes		$2,500 annually**

* 1974 figures derived by escalating Timberland Regional 1973 figures 12%.
** This figure was suggested by State Library personnel.

Figure 7

BUILDING, STAFFING, AND OPERATING COSTS
FOR A 2,500 SQ. FT. MODULAR LIBRARY

Building, set upon foundation	$50,000
Foundation	2,500
Shelving, furniture, etc.	12,000
Audio-visual equipment***	1,000
Transportation @ $5.00 per mile from Kent, Washington	
Western location	500
Eastern location	1,500
Miscellaneous	1,000
TOTAL (Western)	$67,000
(Eastern)	$68,000

Library Assistant II	$600/month + 20% benefits ($120)	$720/month
Janitorial Assistance	(10 hours per week at $3.00/hour + 20% benefits)	144/month
Utilities (Est. average)	Telephone, heat, lights, water	50/month
Copier rent (State contract)		30/month****
300 pages of copying (monthly) at $.025 per page		7.50/month****

***Includes 1-16 mm filmstrip projector; 1 cassette recorder; 1 portable 70 x 70 screen; 1 record player. Source: Washington State University Audio-Visual Center.

****Source: Washington State University Purchasing Office.

C. Mail-Order Delivery Costs

As a result of conversations with State Library and Library Futures Planning Task Force personnel and following a review of the document Study for the Design of an Optimum System for Mail Order Delivery of Books in the State of Washington, it was determined that the North Central Regional Library, of the three MOD centers presently using Sears tabloid-type catalogs, had the most available data for analysis. This data was therefore assumed, and was utilized in the simulation model, and also to suggest alternatives for areas outside the two simulation regions.

The North Central Regional Library had a staff of seven for its MOD system (Figure 8). The average postage costs in 1973 were $0.08525 per circulation which included postage to and from the patron, plus bag, flyer on new books, label and postcard for reordering and miscellaneous supplies. The average catalog costs in 1973 were $0.055 per catalog (when ordered in quantities of 20,000 or more) and an average postage costs of $0.0174 per catalog (Figure 9). Three catalogs per year per household were mailed out (average 4,000 catalogs per month) to rural box holders, branch libraries, confined people, and to other persons requesting mail-order service.

Initial book requirements for each MOD center would be 20,000 books with approximately 8,000 books added each year as updates. At $1.112 (est. 1974 cost) per book, this would represent $22,250 initially and about $8,900 each year.

The mass market paperback books would be purchased through a local jobber under a 25% discount. Children's books are often hard cover edi-

tions, and purchased through large book wholesalers. The book collection would be 30% juvenile and 70% adult. (Personal communication, M. Lynch.)

The simulation program assumed some escalation in catalog costs to $0.06 per catalog in 1974 as opposed to the $0.055 per catalog experienced by North Central in 1973. The cost of $1.112 per book alluded to above are also escalated from the $1.05 per book cost reported by the North Central Regional Library in 1973 (personal communication, M. Lynch).

North Central's MOD costs are provided in Figures 8, 9, and 10.

Figure 8

STAFF AND SALARIES OF THE NORTH CENTRAL REGIONAL LIBRARY
MAIL-ORDER DELIVERY SYSTEM 1973

Classification	Number of Each	Salary	Total Salary/Mo.
Director	1	$875/mo.	$ 875.00/mo.
Clerk II	1-1/2	540/mo.	810.00/mo.
Clerk I	4-1/2	413/mo.	1,858.50/mo.
Subtotal	7		$3,543.50/mo.
Benefits			708.70/mo.
TOTAL COST			$4,252.20/mo.

(served 19,862 households in 1974)
Source: North Central Regional Library document Estimated Mail Order Circulation Segregated by County, Jan. 2, 1975.

Figure 9

FIXED COSTS PER HOUSEHOLD PER YEAR FOR MOD
(3 catalogs/year) 1973

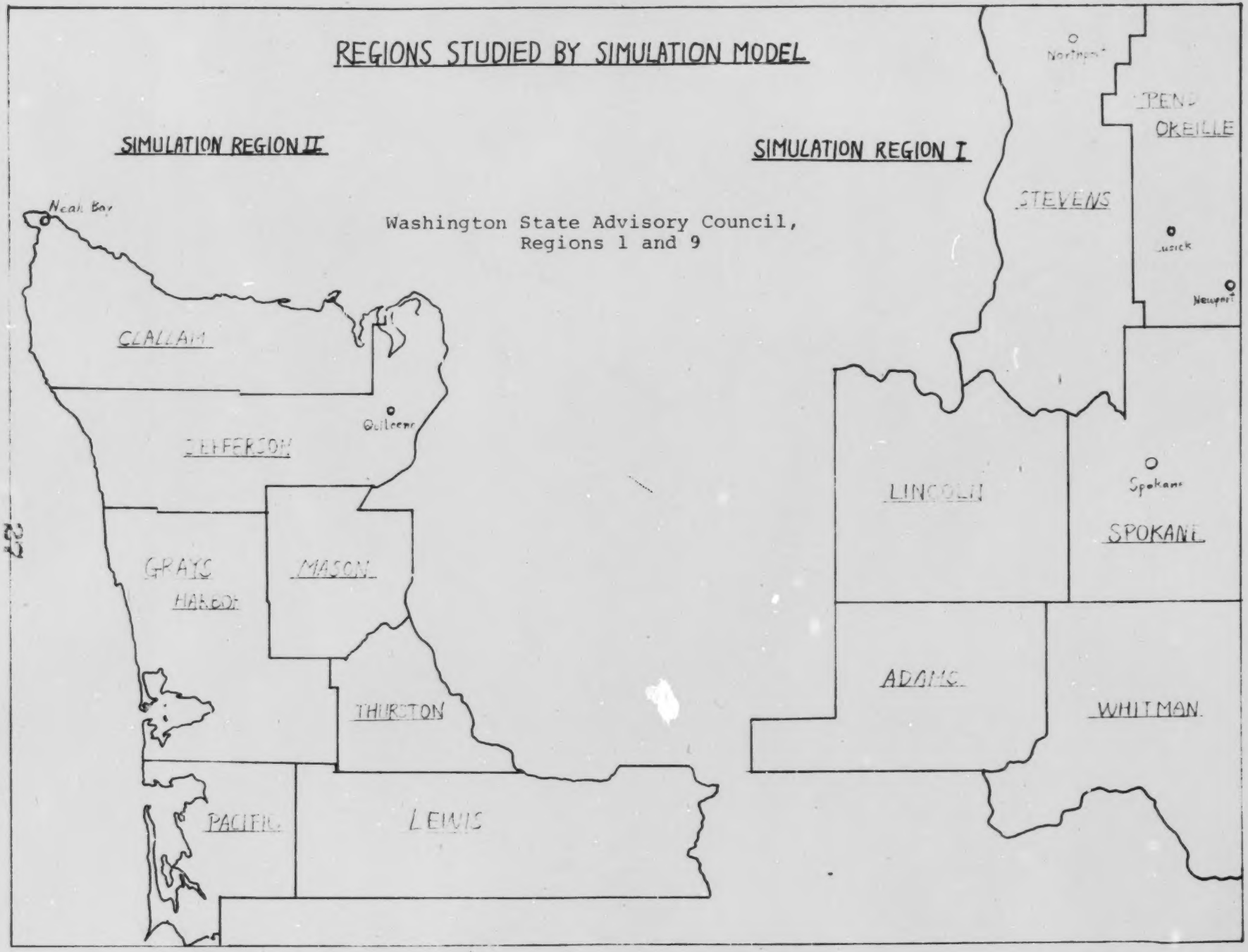
Cost per catalog (0.055 x 3)	$0.16500
Mailing cost per catalog (0.0174 x 3)	0.05220
Mailer, postage, and miscellaneous supplies, per circulation	0.08525
Cost per household, annual, 4 circulations per household (.341 + .16500 + .05220)	0.5582
Cost per household, annual, 6 circulations per household (.5115 + .16500 + .05220)	0.7287
Cost per household, annual, 8 circulations per household (.682 + .16500 + .05220)	0.8992

Figure 10

SPACE COSTS 1974

Building amortization, $.60/sq.ft./year	$1,811.00
Maintenance and janitorial*	3,411.00
TOTAL	$5,222.00

*Included extraordinary sump pump replacement


REGIONS STUDIED BY SIMULATION MODEL
SIMULATION REGION II
SIMULATION REGION I
Washington State Advisory Council,
Regions 1 and 9
Neah Bay
CLALLAM
JEFFERSON
Quilcene
GRAYS HARBOR
MASON
THURSTON
PACIFIC
LEWIS
Northport
STEVENS
OKEILLE
Usick
Newport
LINCOLN
Spokane
SPOKANE
ADAMS
WHITMAN

IV. EXTENSIONS OF SERVICE

A. Bookmobiles

While there is no doubt need for new facilities or new collections in many existing libraries, such considerations are, as observed, beyond the scope of the project. There will be discussion in the section entitled "The Simulation Model" of possibilities for as many as five new buildings, to be considered in the towns of Newport, Cusick or Usk, Northport, Quilcene, and Neah Bay. (The two simulation regions, one including Cusick-Usk, Newport and Northport, and the other containing Neah Bay and Quilcene, were chosen because these two regions seemed to embody the greatest number of variables and complexities.)

With these exceptions, the data available as of November, 1974, indicated that all other towns of 1,000 or more had some kind of existing facility. Again, inquiry into the adequacy of such existing facilities was not made.

1. In Region 9, consideration should be given to extending bookmobile service as follows:

(See the computer printout of the simulation model for this region to determine how the possible routes interact with possible new structures or MOD.)

a. Bookmobile based at Colville:

*Mileage calculated on the following round trips to:

Northport	86
Park Rapids	24
Fruitland	94
Springdale	100
Clayton	100
	404 miles

*These include stops at all towns in between; extended visits once every 3 weeks give 7,272 miles per year. (See (2))

b. Bookmobile based at Newport:

*Mileage calculated on the following round trips to:

Cusick	40
Metaline	148
Camden	28
	216 miles

*These include stops at all towns in between; extended visits once every 3 weeks give 3,888 miles per year.

There is currently a bookmobile operating out of Spokane County Library into northern Spokane County, but there is no service to the communities indicated since they are not within the library district boundaries. The bookmobiles could be made available out of Spokane County Library, which currently has two that are either in full storage or used very lightly (personal communication, D. Devine, Spokane County Library). It is highly likely that both would need rejuvenation, and when either of the bookmobiles is utilized in the simulation model, $4,000 is budgeted for overhaul unless a period of several years has passed, in which case a new one is introduced.

2. In Region 1, consideration should be given to the following bookmobile service pattern.

(See the computer printout of the simulation model for this region to determine how the possible routes interact with possible new structures or MOD.)

a. Bookmobile based at Port Angeles:

*Mileage calculated on the following round trips to:

Sequim	34
Brinnon, etc.	118
Piedmont, Quilcene, etc.	60
	212 miles

*These include stops at all towns in between; extended visits every 3 weeks give 3,700 miles per year.

b. Bookmobile based at Forks:

*Mileage calculated on the following round trips to:

La Push	20
Sappho	24
Clallam Bay and Sekiu	58
Neah Bay	84
Kalaloch and Queets	78
	264 miles

*These include stops at all towns in between; extended visits once every 3 weeks give 4,600 miles per year.

These suggestions involve merely a reshuffling of routes, as there are presently two bookmobiles operating out of Port Angeles that cover Sequim and La Push, Sappho, Clallam Bay, Sekiu, and Neah Bay, along with a number of school stops. Quilcene and other Jefferson County communities currently do not provide library services and in the absence of permanent structures there, it is felt that (assuming, again, state-wide service) the shuffling would be justified. If buildings were located at both Neah Bay and Quilcene, the routes could probably revert to their present structure. It is to be noted that the mileage differential between the proposed possible routing scheme and the present system of routes (personal communications, M. McCall, North Olympic Library) would in fact be less than 500 miles annually. (The present system does, however, provide for trips every two weeks as opposed to trips every three weeks.)

Finally, if some of the present school stops were eliminated, it is not inconceivable that other presently-served stops and those proposed herein could all be handled at a relatively small cost increase. This increase is not specified, as it goes beyond the scope of the project to precisely specify bookmobile routes.

3. Other Bookmobile Routes

These routes are either added onto existing bookmobile routes or obtained by changing existing bookmobile routes.

a. Add Burbank to bookmobile route out of Pasco (Mid-Columbia Regional), adding 210 miles per year.

b. Shift bookmobile out of Ft. Vancouver Regional to cover Stella, Skamokawa, Grays River, Vader, Ryderwood, Carrolls, Ariel, and Cougar (total 3,900 miles per year).

It is to be noted that Ft. Vancouver is, as of this writing, re-examining its bookmobile routes in the hopes of making its service more cost-effective, and to cut down on the long-haul aspect of its present service (personal communication, R. Watson, Ft. Vancouver Regional Library). There is presently slack in its bookmobile time, but there is also a shortage of staff and funds. This possibility would have to be carefully examined with authorities of Ft. Vancouver Regional Library.

c. Maintain the present operation of the Mid-Columbia Regional Library migrant-worker bookmobile by picking up the cost.

Other possible extensions of service, such as extending bookmobile service from the Yakima Valley Regional Library into Kittitas County or the Whatcom County Library bookmobile into Skagit County, are not recommended because of the population sparsity of the areas without service in these two counties.

B. Mail-Order Delivery

The document Study for the Design of an Optimum System for Mail Order Delivery of Books in the State of Washington, (23), referenced earlier exhaustively studied MOD possibilities for extending service to rural unserved areas. There is no point, therefore, in duplicating it. The possibility of providing MOD to non-rural areas in which identifiable library service is lacking is therefore considered. While the Reynolds-Reed, et. al., document (23) makes the case that such service is not likely

to be as cost-effective as is similar service to rural areas, and the authors concur, it may nevertheless be worthwhile to provide some mention of the possibility and this is now done. It is not, however, considered to be a significant part of the contract work.

Table 1 presents the regional figures as they would be if all households in towns under 1,000 not having identifiable library services were included. (The towns and cities deleted and not proposed for service are specified in Appendix E.) These estimated numbers of MOD households were obtained by using 1970 Census figures. Populations of towns and cities with identified existing library service (i.e., buildings or bookmobiles) were substracted from these figures unless the towns were quite small. The final figures were calculated using county-wide ratios of persons to households.

As stated earlier, if MOD were to become a state-supplied service, many of these households would be candidates. While the authors do not wish to argue that the idea is either good or cost-effective, the question of how to provide this service, if desired, is now addressed.

The primary decision factors in locating MOD centers are library facilities available and the structure of the postal system. The number of MOD households has therefore been limited to a maximum of 150,000 or less per MOD center. The number was arrived at following consideration of points made by personnel in the Washington State Library and M. Lynch, together with some consideration of the number of non-rural people actually removed physically from nearby service even though it may be in another community. The number is not to be considered absolute or firm, and it does possess an arbitrary element in its nature. It is, however, probably as defensible as any other.

Table 1

ESTIMATED NUMBER OF MOD HOUSEHOLDS AND SERVICE CENTERS*

Region	Number of Households	Number Households per Proposed Major Center
1	43,541	
2	37,575	81,116
3	89,359	
4	141,206	
5	66,343	296,908**
6	25,650	
7	23,763	49,413
8	18,846	
9	41,000	59,846
TOTAL	487,283	

* Estimate based on 1970 U.S. Census population figures and using county-wide ratios of persons to households.

** To be handled by two MOD centers. One is presently established in Pierce County and the other would be built in King County or Snohomish County. While the Pierce facility is currently being eliminated, it could be re-introduced if deemed desirable.

Any town under 1,000 with bookmobile service or a permanent facility is deemed to be "served." In some instances towns with small facilities were, however, included. See Appendix E for a list of all towns and cities deleted.

Six MOD centers are proposed which will be located according to existing facilities and populations. These centers are as follows:

1. Spokane County Library has been a MOD center until recently. It has the facilities and is well located to serve regions 8 and 9.

2. North Central Regional Library is well organized with an efficient MOD center presently in operation. This center could serve regions 6 and 7.

3. Ft. Vancouver Regional Library has a small MOD center, recently instituted, which would serve regions 1 and 2 when expanded.

4. Pierce County Library has been used as a MOD center but is limited in its available facilities. It is therefore proposed to start the center with the present facilities, which would serve region 3 and part of region 4. Since demands for MOD service are projected to increase beyond the capacity of the existing facility, a modular building of 2,500 sq. ft. would be built to handle the MOD service two years after the service is initiated, at a present cost of about $67,000. (See Figure 7, subtract $1,000 due to audio-visual dquipment, add $1,000 due to shelving. While it is not completely clear what differences would exist between the modular structure as intended for MOD and the same structure as intended for use as a library, it was not felt that the MOD structure would be more expensive.)

5. Neither the Sno-Isle Regional Library nor the King County Library have the facilities at the present time. A modular building of 2,500 sq. ft. would be built to handle the MOD service for region 5 and part of region 4 at a present cost of about $67,000. Everett is a postal center and a possible site.

The projected additions to staff for each center are as follows:

1. Spokane County Library

Classification	Number	Salary
MOD Director	1	$650/mo.*
Clerk II	2	525/mo.
Clerk I	4	413/mo.

*The salary figures for MOD personnel are suggested as applicable by D. Cutler and J. Brong. It should be pointed out that the simulation runs for simulation Region I envisaged 3 clerks rather than 4. The number of 4 may, however, be better.

2. North Central Regional Library

Classification	Number	Salary
Clerk I	1	$413/mo.

3. Ft. Vancouver Regional

Classification	Number	Salary
MOD Director	1	$650/mo.
Clerk II	1	525/mo.
Clerk I	3	413/mo.

4. Pierce County

Classification	Number	Salary
MOD Director	1	$650/mo.
Clerk II	2	525/mo.
Clerk I	4	413/mo.

5. Sno-Isle Regional

Classification	Number	Salary
MOD Director	1	$650/mo.
Clerk II	2	525/mo.
Clerk I	4	413/mo.

C. New Buildings

New buildings (excluding proposed for MOD), have been proposed at several possible locations within the state.

These possible new structures are included in the computer analysis along with MOD and bookmobile service, and the reader is referred to that part of this document for the manner of their inclusion in the alternatives considered. However, there is some point to delineating them at this time. They are:

1. Newport (population ca. 1,525) presently has a facility that, due to its size and condition, requires replacement. This possibility is considered. If the library is built and the decision is made to operate a bookmobile out of Newport, another module of 500 square feet is added to accommodate the added service.

2. Northport (population ca. 431) is located in an extremely isolated area in northern Stevens county.

3. Cusick (population ca. 271) is located in central Pend Oreille County, miles from the nearest library. A library in Cusick would also serve Usk (population ca. 200) and the Kalispell Indian reservation.

4. Neah Bay (population ca. 600) is located at an extremely isolated corner of Clallam County. This library would also serve the Makah Indian reservation.

5. Quilcene (population ca. 900) is located in Jefferson County.

V. THE COMPUTER SIMULATION MODEL

In several of the regions it was not obvious what path should be taken to fulfill the need for extended library services, as MOD, bookmobiles, new permanent structures, and any mixture thereof were all possibilities. To provide decision-makers with a delineation of the alternatives and the costs of each, a computer simulation model was constructed, the purpose of which was to provide possible mixes of each of the three kinds of service, to present different timing patterns for their implementation, and to delineate costs.

In each of the two regions chosen for the simulation study, several alternatives were defined. One was to do nothing, that is, to leave things as they currently are. Another alternative was to provide mail-order delivery to all rural boxholders and all unserved towns. The other alternatives involved the construction of one or more permanent libraries, the introduction of bookmobiles over certain specified routes, and mixtures of all of these possibilities. The timing of the alternatives was also included. The planning horizon was six years; the time periods were each six months long. A possible alternative sequence might have been, for example, to prepare for MOD during the first time period and to introduce it the second; in the fourth time period, perhaps a new building would be constructed and ready for use by the fifth. In the seventh period, perhaps a bookmobile would be introduced. Meantime, MOD activity would be growing, and perhaps more staff members needed to handle it. Then in the tenth period a second new building might be constructed and ready for use by the eleventh period, and the town hosting the new building deleted from a bookmobile route. In each instance, all staff costs, book replace-

ment and update costs for both MOD and new libraries, the costs of utilities, magazine subscriptions, janitorial service, copying facilities, records, bookmobile gasoline, oil, repairs and maintenance, postage and catalogs, flyers and mailers were all included, as was inflation. (The details of the four inflation cases are stipulated on the computer printout. All other costs details are given in Section III, page 8.)

Clearly, the timing of the introduction of the alternatives was important: it would obviously cost less, over the planning horizon, to build three new libraries during the second time period than to build the same three libraries during the last period, due to the ravages of inflation, even though the end result might be the same. This kind of consideration was taken into account also.

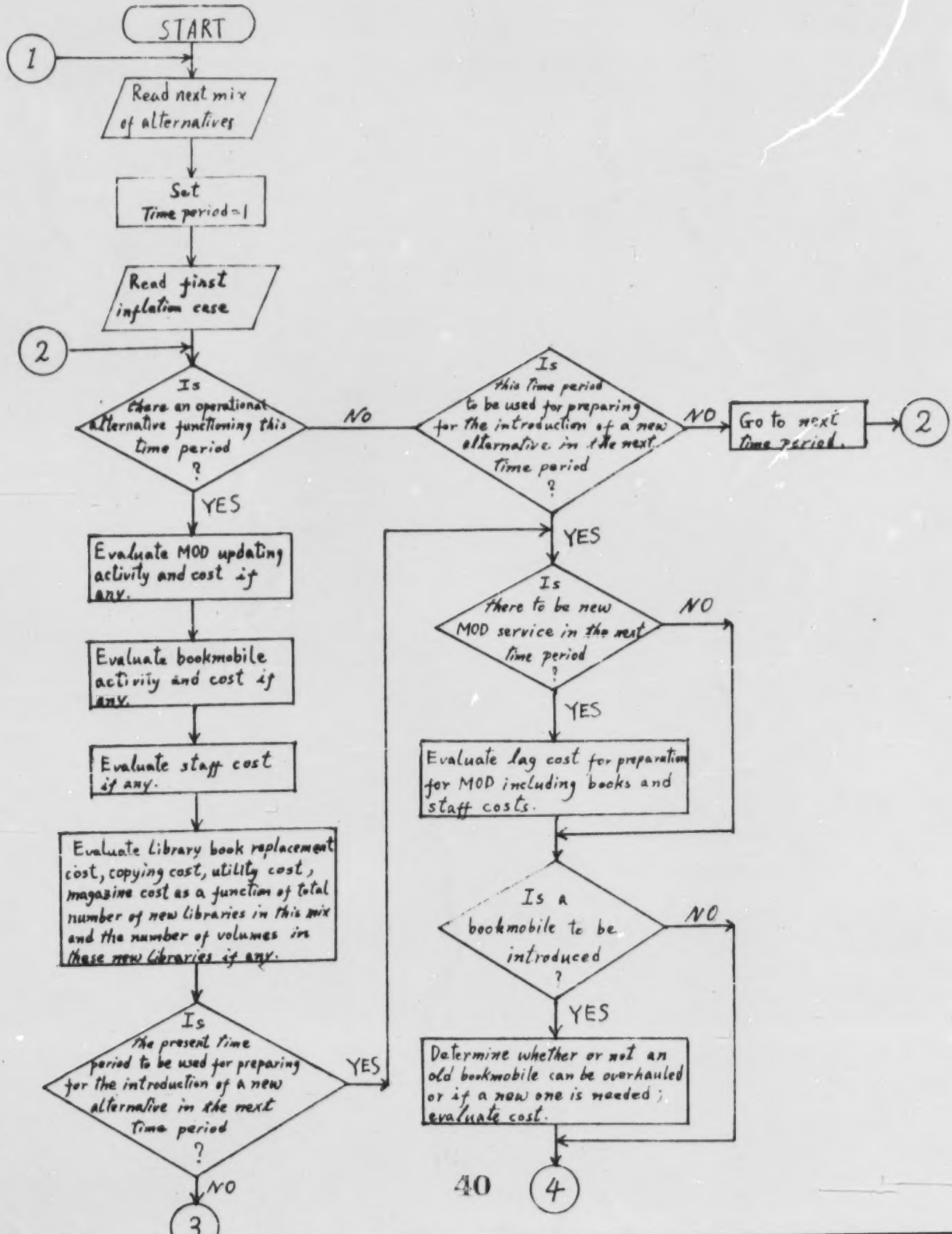
There was input information for each alternative, the details of which are given in the printout, that included purchase of MOD books, the overhaul cost of any bookmobiles to be introduced, the construction cost of any new libraries in existence during the operation of the alternative in question, the number of volumes housed in these new libraries, MOD households, miles driven during each time period by bookmobiles, and staff costs.

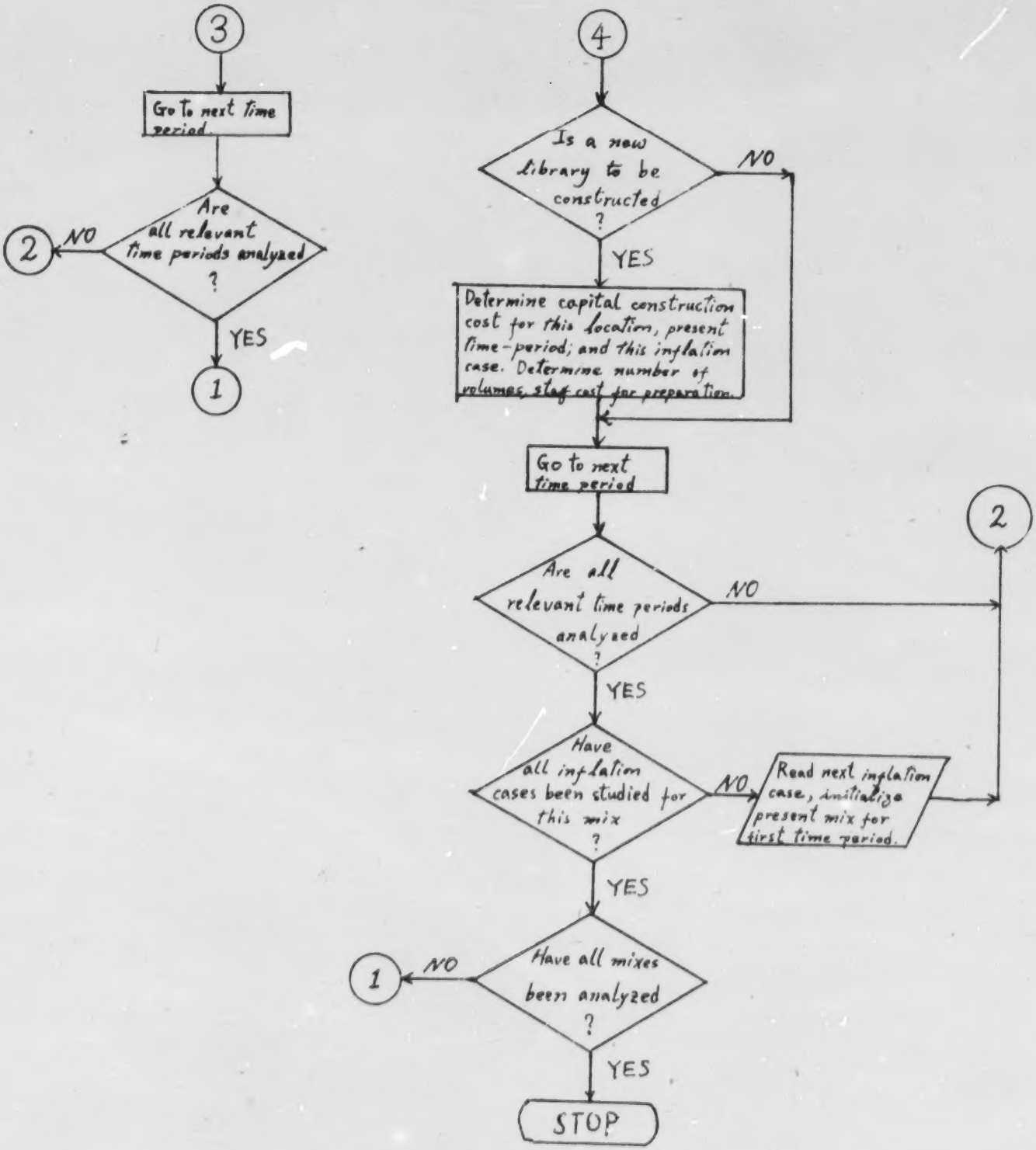
In addition, there was for each sequence of alternatives to be studied, input information giving the starting and ending date for each of the alternatives. The program was structured so that each alternative built upon those in existence before, so that if an alternative utilizing MOD and two bookmobiles was replaced by one utilizing MOD, one bookmobile, and a building, the first-period cost differentials between the two were

calculated for each category of data and the differentials, if positive, then escalated by the rate of inflation appropriate for the current time-period. The MOD activity factor was escalated in each time-period following the introduction of MOD in a manner that seemed appropriate and consistent with prior MOD experience. (It is to be noted that while one would expect bookmobile circulation levels and new library circulation levels to also escalate in the time-periods following introduction, data specifically associating an economic cost with these increases in circulation did not appear available in the same sense as it was available for MOD, and therefore the model did not include these considerations. When the data becomes available, inclusion in the computer model and program will be straightforward and not difficult.)

While specific application of the simulation model varied slightly between the two regions, due to differences in the alternatives considered, the following flow chart describes the structure of the model as implemented in both instances.

SIMULATION MODEL FLOW CHART


START
1
Read next mix of alternatives
Set Time period=1
Read first inflation case
2
Is there an operational alternative functioning this time period ?
NO
YES
Is this time period to be used for preparing for the introduction of a new alternative in the next time period ?
NO
Go to next time period.
2
YES
Evaluate MOD updating activity and cost if any.
Evaluate bookmobile activity and cost if any.
Evaluate staff cost if any.
Evaluate library book replacement cost, copying cost, utility cost, magazine cost as a function of total number of new libraries in this mix and the number of volumes in these new libraries if any.
Is the present time period to be used for preparing for the introduction of a new alternative in the next time period ?
YES
NO
3
Is there to be new MOD service in the next time period ?
NO
YES
Evaluate lag cost for preparation for MOD including books and staff costs.
Is a bookmobile to be introduced ?
NO
YES
Determine whether or not an old bookmobile can be overhauled or if a new one is needed; evaluate cost.
40
4


3
Go To next time period
Are all relevant time periods analyzed ?
NO
2
YES
1
4
Is a new library to be constructed ?
NO
YES
Determine capital construction cost for this location, present time-period, and this inflation case. Determine number of volumes, staff cost for preparation.
Go to next time period
2
Are all relevant time periods analyzed ?
NO
YES
Have all inflation cases been studied for this mix ?
NO
Read next inflation case, initialize present mix for first time period.
YES
Have all mixes been analyzed ?
1
NO
YES
STOP

The model was coded in Fortran IV, primarily because of the fact that the Fortran language is available on nearly all machines, including new mini-computers, and special-purpose simulation languages such as GPSS and SIMSCRIPT. As now dimensioned, the program can handle seven distinct alternatives (defined in the printout), four inflation cases, and twelve time periods of any uniform length. The program can be adjusted with appropriate internal changes for any number of alternatives, inflation cases, and time periods.

Past experience has suggested that computer printouts often become separated from their supporting typescript and that some confusion often results. For this reason, it was decided to make the results of the simulation runs self-contained, so that the printout could be read as a stand-alone document if that was desired. The remainder of this document is broken into three parts: (a) the results of the computer simulation for Simulation Region I (an area including Spokane and neighboring counties--see map on following page), together with a description of the alternatives examined, the data, and the name of the variables; (b) the results of the computer simulation for Simulation Region II (an area located on the Olympic Peninsula), together with a description of the alternatives examined, the data, and the names of the variables; (c) a sensitivity analysis of the simulation results for Simulation Region I, including studies of the manner in which the simulation results change when sensitive program parameters change. It can be expected that the simulation results of Region II would vary in a similar way under similar circumstances.

VI. READING THE OUTPUT

While the output of the simulation runs is probably quite self-explanatory, it may be helpful to give an interpretation.

The starting and ending time-periods for each alternative are presented prior to the results. If, for example, Alternative C is stated to start in period 3 and end in period 7, the intention is that the alternative be fully operational at the start of period 3 and that it continue in operation until the beginning of period 7.. Any alternative with a starting date of 13 is not being included in the simulation run in which the date is given, while an operational alternative with an ending date of 13 will be in effect through the end of period 12, which is the end of the present planning horizon of 6 years.

For each mix of alternatives, results are presented, in order, for each of the four assumed inflation scenarios. The assumed rates of the inflation cases are stated, for each time-period, as is the cumulative impact of the inflation case on first-period costs.

The results are then presented by time-period. Each period will have costs (which may be 0, as is always the case with time-period 1) that are attributed to library services in operation during that period. In addition, if new services are to be in operation by the start of the next time-period, lag, or start-up, costs are incurred during the present period, and these are specified. Finally, a total time-period cost is stated, and cumulative costs over all time-periods up to and including the present period are stated. The program then moves along to the next time-period. When all 12 time-periods have been examined, a total cost over the entire 6-year planning horizon is given, and the program repeats the same

alternative mix for the next inflation case. When all inflation cases have been covered, the next alternative mix is defined by data giving the beginning and ending periods for each alternative, and the program begins another analysis with the initial inflation case.

Finally, some admonition must be given against too much belief in the last two digits, or perhaps in some cases, even the last three, of the cost figures presented. They are included primarily for the reader who might wish to retrace some aspect of the program, and also for general reader interest. The data does not, however, support conclusions that are specified down to the last dollar, and some rounding should definitely be done, by the decision-makers and to the extent felt best, before the numbers are utilized to support funding requests.

The computer printouts for simulation Regions I and II are accompanying documents. For technical information about the program, interested persons may contact the Washington State Library or the Principal Investigator.

VII. THE SENSITIVITY OF THE SIMULATION RESULTS TO CHANGES IN DATA AND PARAMETERS

It is always wise to undertake to isolate the effects on the conclusions of any simulation model of variations in the data used. In the first place, data is often "soft," or subject to errors of one kind or another, and the data gathered for this study is no exception. In the second place, experienced, knowledgeable people may not agree on the same figures. And finally, data that is "hard" today may change tomorrow, perhaps because economic conditions change or because of some legal aspect that causes a precipitous change in some piece of data. Possible examples in point could be postage and gasoline prices.

With this in mind, selected sequences or mixes of the alternatives were run for Region I with modified data configurations designed to determine how the results of the model would vary if the data were subject to change. Data examined included gasoline costs, MOD director's salaries (since there seems to be some difference of opinion as to the appropriate salary), MOD book costs (the data used was projected from 1973, and is possibly too low), MOD postage costs, MOD catalog costs, the MOD activity factor per household receiving MOD catalogs, and the construction cost of new libraries. These items were singled out for analysis because there was some other kind of inherent uncertainty. The data items not subjected to the sensitivity analyses were felt to be either much firmer or else adequately handled by the variation in inflation rates to which all data items were subjected. These items are now discussed in individual detail.

A. Variations in MOD Data Items

Mail-order delivery costs received substantial attention in the sensitivity analysis. The items analyzed included the salary of the MOD director, the cost of MOD books, costs of postage, costs of catalogs, and the MOD activity factor.

There is substantial disagreement among informed people as to the salary appropriate for the MOD director in the Spokane region. The simulation program assumed a salary of $650/month plus 20% benefits. North Central Regional Library, however, pays its MOD director $875/month plus benefits. The natural question arises, "What would be the impact on the simulation results of the higher salary?" To obtain an overall picture, the higher salary was assumed and the program run for each inflation case and several mixes of alternatives. The results are as follows:

MIX I:

Starting and Ending Dates for Alternative			
	A	1	2
	B	2	4
	C	4	7
	D	7	10
	E	10	11
	F	11	12
	G	12	13

Inflation Case 1 (inflation)

The standard run had a six-year cost of $1,313,701; the higher-salary run a six-year cost of $1,332,331; a difference of $18,630 or 1.4%.

Inflation Case 2 (Intermediate inflation)

The standard run demonstrated a six-year cost of $1,864,239; the higher-salary run a cost of $1,889,570; a difference of $25,331 or 1.36%.

Inflation Case 3 (High inflation)

The standard run had a six-year cost of $2,120,869; the higher-salary run a cost of $2,148,978; a difference of $28,109 or 1.32%.

Inflation Case 4 (Low inflation)

The standard run had a six-year cost of $1,728,204; the higher-salary run a cost of $1,751,967; a difference of $23,763 or 1.38%.

MIX II:

Starting and Ending Dates for Alternative	A	1	2
	B	2	13

Inflation Case 1 (No inflation)

The standard run had a six-year cost of $412,488; the higher-salary run a cost of $431,119; a difference of $18,630 or 4.5%. While the dollar difference will remain constant through the various mixes of alternatives, holding the inflation case the same, the percentage will vary as a function of total cost. (The curious reader will note that 18,630 = 6(225)(11) + 3(225) + 20% benefits.)

Conclusion

The difference between a salary of $650/month and $875/month for the MOD director is not significant when only one MOD director is involved. If applied across the state to a number of MOD centers, however, it could become a matter of importance to individuals other than the MOD directors.

The cost of $1.112/MOD book in December, 1974, was escalated from 1973 figures of $1.05/book, obtained from North Central Regional Library. It is not likely that this cost is too high. On the other hand, it could easily be too low. A further escalation of 10% in the first time-period cost of these books was therefore assumed and the program run for several representative mixes of alternatives, for all inflation cases. Sample results are as follows:

MIX I:

Starting and Ending Dates for Alternative			
	A	1	2
	B	2	4
	C	4	7
	D	7	10
	E	10	11
	F	11	12
	G	12	13

Inflation Case 1 (No inflation)

The standard run gave a six-year cost of $1,313,701; the increased-cost run a six-year cost of $1,319,939; a difference of $6,238 or .5%. This is miniscule.

Inflation Case 2 (Intermediate inflation)

The standard run gave a six-year cost of $1,864,239; the increased-cost run a six-year cost of $1,872,316. The difference is $8,077 or .4%.

Inflation Case 3 (High inflation)

The standard run gave a six-year cost of $2,120,869; the increased-cost run a six-year cost of $2,129,696. The difference is $8,827 or .4%.

Inflation Case 4 (Low inflation)

The standard run gave a six-year cost of $1,728,204; the increased-cost run a six-year cost of $1,735,854; a difference of $7,650. In the case of this mix, any error in the estimated cost of MOD books has a negligible impact on the results of the model.

MIX II:

Starting and Ending Dates for Alternative			
	A	1	2
	B	2	13

This mix, again, is MOD only, instituted as quickly as possible.

Inflation Case 1 (No inflation)

The standard run gave a six-year cost of $412,489; the increased-cost run a six-year cost of $418,727. The difference is $6,238--the same as in the earlier case. This is expected, and this difference pattern would persist throughout any further analysis.

Conclusion

Any error in the estimated cost of MOD books is negligible, on a percentage basis.

The aspect of postage costs is another imponderable in MOD costs. Obviously there is a lot of mailing of both books and catalogs, and the question, "What would be the impact of a sharp increase in postage costs, over and above the assumptions of inflation?" To determine this, cost of postage for both catalogs and books were escalated, 10% for the catalogs, and something under 10% for the books (the reason being that the data on postage costs for books was imbedded in data including the costs of mailers and would not be completely isolated). The results are as follows:

MIX I:

Starting and Ending Dates for Alternative			
	A	1	2
	B	2	4
	C	4	7
	D	7	10
	E	10	11
	F	11	12
	G	12	13

Inflation Case 1 (No inflation)

The standard run had a six-year cost of $1,313,701; the higher-postage run a cost of $1,324,212; a difference of $10,511 or .8%. This difference is miniscule on a percentage basis.

Inflation Case 2 (Intermediate inflation)

The standard run had a six-year cost of $1,864,239; the higher-postage run a cost of $1,879,352; a difference of $15,133 or .8%.

Inflation Case 3 (High inflation)

The standard run had a six-year cost of $2,120,869; the higher-postage run a cost of $2,138,135; a difference of $17,266 or .8%.

Inflation Case 4 (Low inflation)

The standard run had a six-year cost of $1,728,204; the higher-postage run a cost of $1,742,160; a difference of $13,956 or, again, about .8%.

Runs with other mixes of the alternatives produced similar results, except that the percentages would be higher with lower-cost alternatives such as MOD only.

Conclusion

Postage increase would not impact heavily on the results of the simulation model.

Another source of concern vis-a-vis MOD costs could be the costs of MOD catalogs. Along with everything else, they are subject to inflation. However, there are indications that paper products may have escalated in price more than the inflation rate experienced in recent years would indicate. Accordingly, the first time-period catalog costs, already inflated from the $.055/catalog experienced by North Central Regional Library in 1973 to $.06/catalog, are inflated an additional 10%. The question is, "What would be the impact of the results obtained by the simulation model if first-period catalog costs are inflated 10%?"

The results are as follows:

MIX I:

Starting and Ending Dates for Alternative		
A	1	2
B	2	4
C	4	7
D	7	10
E	10	11
F	11	12
G	12	13

Inflation Case 1 (No inflation)

The standard run had a six-year cost of $1,313,701; the higher-catalog cost run a cost of $1,317,760; a difference of $4,059 or .3%. This is, again, miniscule.

Inflation Case 2 (Intermediate inflation)

The standard run had a six-year cost of $1,864,239; the higher-catalog cost run a cost of $1,869,814; a difference of $5,575 or .29%.

Inflation Case 3 (High inflation)

The standard run had a six-year cost of $2,120,869; the higher-catalog cost run a cost of $2,127,076; a difference of $6,207 or .29%.

Inflation Case 4 (Low inflation)

The standard run had a six-year cost of $1,728,204; the higher-catalog cost run a cost of $1,733,421; a difference of $5,217 or .3%.

The cost figures for other mixes would be similar, although the percentages would change, again, as a function of the total cost of the mix.

Conclusion

The effect of relatively higher catalog prices is negligible.

Perhaps the greatest unknown factor of all, however, is the MOD activity level of books ordered per household receiving a MOD catalog. The range in cost from a low-activity factor to a high-activity factor is, moreover, more substantial, especially at a high rate of inflation. The figures used in the standard runs were apparently reasonable, having been derived by a mixture of calculation, judgment, and guess from recent MOD experience within the state, especially at North Central Regional Library. They are, however, probably the softest data used in the model. As will soon become apparent, they also are among the most sensitive. To

obtain a handle on the effects of variations in these MOD activity factors, the factors used in the standard runs were both increased and decreased by 30%. If this factor of change is larger than those used heretofore with other data items, it is also felt to be a more reasonable extreme variation than would, say, 10%. The results are as follows:

MIX I:

Starting and Ending Dates for Alternative			
	A	1	2
	B	2	4
	C	4	7
	D	7	10
	E	10	11
	F	11	12
	G	12	13

Inflation Case 1 (No inflation)

The standard run had, as before, a six-year cost of $1,313,701; the low-activity factor (70% of standard) a cost of $1,285,699; and the high-activity factor (130% of standard) a cost of $1,341,703. The difference between high and standard is $28,022 or 2%; the difference between low and standard is the same, and the percentage is the same. The difference between the extremes is $56,000.

Inflation Case 2 (Intermediate inflation)

The standard run had a six-year cost of $1,864,239; the low-activity factor a cost of $1,823,749; and the high-activity factor a cost of $1,904,728. The difference between standard and low is $40,490 or 2.2%; the other difference is the same; the extreme difference is $80,980. This begins to be an impressive figure.

Inflation Case 3 (High inflation)

The standard run had a six-year cost of $2,120,869; the low-activity factor a cost of $2,074,469; and the high-activity factor a cost of $2,167,268. The difference between low and standard is $46,400 or 2.18%; the other difference being equal; and the extreme difference is about $93,000.

Inflation Case 4 (Low inflation)

The standard run, as before, had a six-year cost of $1,728,204; the low-activity factor had a cost of $1,690,877; and the high, a cost of $1,765,531. The difference between standard and low is $37,327 or 2.15%.

Again, the difference between high and standard is the same, and the extreme difference is about $75,000.

Conclusion

The MOD activity factor, when coupled with inflation, may be a significant source of deviation from the expected cost of any alternative involving MOD. Percentagewise, this would be very significant if the mix of alternatives included only MOD (6.8% for the no-inflation case; 7.08% for the intermediate inflation case; 7.22% for the high-inflation case; 7% for the low-inflation case, all measured from the standard case; the extremes, clearly, are double).

B. Variations in Bookmobile Operating Costs

While there are a number of imponderable variables in the case of alternatives that include bookmobile service, such as purchase price or overhaul costs, these are not too likely to differ from the standard figures used in the program by more than very few thousand. A question can, however, be raised regarding the impact of increased gasoline costs on alternatives involving bookmobiles. The answer will be that gasoline costs could go up $.35/gallon over today's prices, over and above the inflation rates incorporated into the program, and the effect would not be particularly serious. Two cases are considered: an increase in gasoline costs in the first time-period to $.70/gallon, and an increase to $.90/gallon. The results are as follows:

MIX I:

Starting and Ending Dates for Alternative			
	A	1	2
	B	2	3
	D	3	13

(Note that Alternative D is that alternative having the highest bookmobile mileage.)

Inflation Case 1 (No inflation)

The standard run had a six-year cost of $868,044; the $.70/gallon case had a cost of $868,957; and the $.90/gallon case a cost of $870,161. The difference between standard and the $.70/gallon case is $913 or .1%; the difference between standard and the $.90/gallon case is $2,117 or .24%. This is negligible.

Inflation Case 3 (High inflation)

The standard run had a six-year cost of $1,272,837; the $.70/gallon case had a cost of $1,274,269; a difference of $1,432 or .11%. The $.90/gallon case had a cost of $1,276,161; a difference (over the standard) of $3,324 or .25%. There is no real point in presenting the other inflation cases.

C. Variations in Building Costs

Some of the alternatives under consideration by the model call for as many as three new buildings. While it is felt that the building costs figures utilized in the model are probably as valid as is possible short of inquiry substantially beyond the budget of this project, it is certainly reasonable to envisage the possibility of errors of, say, 10%. Accordingly, the question is posed, "What would be the impact of increases in building costs of 10% over the amounts envisaged by the program?" The results are as follows:

MIX I:

Starting and Ending Dates for Alternatives			
	A	1	2
	B	2	4
	C	4	7

D	7	10
E	10	11
F	11	12
G	12	13

Inflation Case 1 (No inflation)

The standard run had a six-year cost of $1,313,701; and the higher-building cost case a cost of $1,335,501; a difference of $21,800 or 1.66%.

Inflation Case 2 (Intermediate inflation)

The standard run had a six-year cost of $1,864,239; the higher-building cost case a cost of $1,895,279; a difference of $31,040 or 1.67%.

Inflation Case 3 (High inflation)

The standard run had a six-year cost of $2,120,869; the higher-building cost case a cost of $2,156,419; a difference of $35,550 or 1.68%.

Inflation Case 4 (Low inflation)

The standard run had a six-year cost of $1,728,204; the higher-building cost case a cost of $1,757,002; a difference of $28,798 or 1.67%.

Comparing the costs just examined with those arising from the following circumstances is also of interest.

MIX IV:

Starting and Ending Dates for Alternative			
	A	1	2
	B	2	3
	G	3	13

Inflation Case 1 (No inflation)

The standard run had a six-year cost of $1,603,109; the higher-building cost case a cost of $1,624,909; a difference of $21,800 or 1.36%.

Inflation Case 3 (High inflation)

The standard run had a six-year cost of $2,265,683; the higher-building cost case a cost of $2,290,177; a difference of $24,494 or 1.1%. The percentage of difference is somewhat less with the mix in which the new buildings are constructed as quickly as possible.

Attention is also called, incidentally, to the high inflation standard runs for Mix I and Mix IV. The gain in avoided building cost inflation is more than made up for by the added years of book replacement, staff costs, bookmobile mileage, and other costs; the difference in the standard runs is $144,814 and Mix IV is the most costly, even though the level of service is the same at the end of the six-year period.

VIII. CONCLUSIONS

The authors have several additional observations to make that may be of use to Library and Task Force authorities.

One typical result of any attempt to construct a simulation model and apply it to existing real world problems is that inadequacies in operational data appear. This project is no exception. As the research team conducted its studies on input for the model, serious inadequacies and inconsistencies in the recording of the bookmobile data materialized, and inadequacies in the maintenance of new library construction data became apparent.

It is suggested that the State Library consider gathering and appending to its very valuable Annual Statistical Issue data that could be reported to it on such items as bookmobile costs and new building construction. The recording of bookmobile data across the state is not done to uniform standards, the data is not equally reliable, and at times it is confounded with other factors. A possible state-wide format for bookmobile records is appended (see Appendix D) and is strongly suggested for all libraries providing bookmobile service. If this form were adopted, the incorporation of state-wide bookmobile operating and maintenance costs into the Statistical Issue would be relatively straightforward, and probably very much worth doing. Similarly, it would appear to be useful for the State Library to construct a file containing statistics on any new libraries constructed within the state. This would be done with relatively little work if copies of any accepted library bids were forwarded to the State Library for filing.

As to the simulation model, it is the understanding of the authors that the concept of state-wide planning and program operation under which this work was done is not at this moment planned for implementation. Be that as it may, the model is still usable at the local or regional level if the numbers resident in the model are altered to reflect the local circumstances. Such items as copying cost, utilities, salary ranges and vendor book cost would have to be re-costed using local data. The principal investigator stands ready to assist any possible user of this simulation model to adapt it to his needs.

Finally, the principal investigator would like to suggest some directions for future work and research.

If data could become available that related economic cost to growth in the circulation pattern of a new library, there is intrinsically no problem in extending the simulation program to build in the need for added help after the circulation reached a certain level. Similarly, more money for subscriptions, records, copying, book replacement, and other activity-related factors could also be provided by the program, as a function of circulation. The necessary data could consist of historical instances in which more help was added at some given library when the circulation reached a given level. The more libraries for which this data was available, the more reliable it would be, and the better one would feel about incorporating it in the simulation program. Similarly, it ought to be possible to associate a "need" or increased demand for magazines, records, etc., with circulation growth, and it would be interesting to undertake a study to gather this data and utilize it in the model.

It would also be interesting to run the model for monthly time periods and incorporate into it statistics on seasonal circulation fluctuations, season-dependent costs (such as heat) and other relevant factors. In this instance the model could become a model for operations as well as for planning.

But perhaps the most interesting extension would involve adapting the model to an interactive mode, in which a planning authority at the state or regional level could sit at a computer terminal (after a little instruction) and type into the computer the alternatives he or she wished to analyze, along with the relevant data. Parameters could be varied via the terminal, and the librarian could display to his or her board or to legislators the economic costs associated with each of many alternatives for library development. The prospect is very exciting.

IX. ACKNOWLEDGMENTS

The authors wish to acknowldge the many librarians of the state who cooperated fully in providing us with the information necessary to undertake the project.

Louise E. Morrison, Michael P. Lynch, and Doreen Y. Purcell are due especial gratitude. We are also grateful to the Library Development staff of the Washington State Library.

And finally, gratitude is due Joan Mina, who did an excellent job of typing, and in some cases editing, the manuscript.

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APPENDIX A

LIBRARY BUILDING PROGRAM
Bonney Lake Library
Pierce County Library

(Abstracted)

The town of Bonney Lake is located on the northern edge of Pierce County, east of Sumner and west of Buckley. Since its incorporation in 1948, the town's population has increased from a few hundred to nearly 4,000. Additionally, the population of the area around the town has increased substantially. It is estimated that a library in Bonney Lake would serve between 6,500 and 7,500 people.

Site Considerations

The proposed leased site meets the criteria for good site location. It will be at the intersection of three main roads and across the street from a small shopping center. The site is easily accessible, has good visibility, and should present no particular construction problems. The address would be 8611 Locust Avenue, Bonney Lake, Washington.

Electricity and water are readily available; a septic tank will have to be installed. Site preparation, including a foundation, will be done by the town.

Building Requirements

A building of approximately 2,000 square feet is planned for this location. Book capacity should be 12,000 volumes, with an initial collection of 10,000 volumes. The 150 lbs. per square foot weight of books must be allowed for.

A one-level portable, modular building is required. The unit must comply with the Washington State Factory Built Housing and Commercial Structures Law.

To meet all requirements of the current zoning of the site, it appears that the building could be no more than 25 feet wide. In order to have a more desirable configuration for the 2,000 square foot building than this would allow, Pierce County Library will apply for a variance to permit a facility of up to 38 feet in width.

Architectural Design

Since the general contract will include designing the building, initial blueprints must be submitted with all bids. Pierce County Library will consult with the successful bidder to arrive at a final plan. Sketches of possible exterior designs must also be submitted with all bids to insure that the building will be attractive.

Exterior Requirements

Entrance--one main entrance. If possible this should be easily reached from the parking area and needs to be readily visible from the circulation desk area. The doors must be wide enough to accommodate a wheelchair and for the same reason there must be no steps. A covered entry with some provision for a mat is desirable.

Book Return

Mosler Dropository or approved equal with lock, so located as to feed into the workroom. Must be convenient for public use when library is closed.

Bicycle Rack

Near the entrance. To be provided by Pierce County Library.

Building Sign

In keeping with the building, and according to code; either on the building or on a standard, but prominently displayed to be visible from the street in both directions. Well lighted. To be provided by Pierce County Library or Bonney Lake.

Flood Lights

To be provided by Bonney Lake as a part of the site preparation.

Truck Delivery Entrance

To open directly into the work/staff room if site restrictions allow. Would also serve as staff entrance and emergency exit.

Mail Box

Properly located, functional mail box which is also aesthetically pleasing. To be provided by Pierce County Library or Bonney Lake.

Parking

To meet code. To be provided by Bonney Lake.

Landscaping

To be provided by volunteers.

Interior General Requirements

Wall area--maximum commensurate with aesthetics and natural lighting. To provide wall shelving space and cut window cleaning costs to a minimum. Material used to be low maintenance. Since wall shelving will have an enclosed base, low outlets or wall heaters are not acceptable. Shelving to be provided by Pierce County Library.

Seating areas--open space. Visible from the service and circulation desk area.

Circulation desk--easily accessible by all patrons and from the work/staff room. So located as to offer exit and restroom control.

Lighting--must be at least 75 foot candles maintained at writing and reading surface. Provide for central switch-off plus individual switch-off.

Electric wall clocks--public area and work/staff room. Easily read. Provided by Pierce County Library.

Electrical outlets--easily accessible throughout the building. Must be adequate for future needs--copiers, microform readers, audio-visual equipment, etc.

Thermostat--if in public area, must be of lock type.

Floor surfaces--carpeted, except for restrooms.

Air-conditioned--throughout.

Heating--must leave wall areas free (see above).

The following are suggested area sizes and their relationship to each other. Also indicated are counters, cupboards, etc., which are

expected to be part of this project. This last aspect will need to be detailed and refined.

PUBLIC AREAS--1,610 Square Feet

I. Adult--1,210 square feet to provide space for:

(a) Shelving space for 6,800 adult volumes and 1,000 juvenile non-fiction volumes, using 6 foot stacks.

(b) Reader space for about 20 persons at tables and another 4 persons using lounge-type seating.

In addition to the furnishings above, a record display unit, shelving for cassette tapes, 8mm films, and magazine, pamphlet file, and a paperback display unit are located in this space.

II. Juvenile--400 square feet to provide:

(a) Shelving space for 2,200 volumes using 5 foot high stacks for juvenile fiction and 3 foot high stacks for Easy books.

(b) Reader space for 12 persons at tables scaled for children.

A display unit for paperbacks is also located in this area.

III. Circulation Area--150 square feet

Located here will be: a counter-height circulation desk (to be in general contact) and about eight 3 foot shelves to the rear of the desk. Access to the workroom should be immediate from behind desk. Also in this area are the card catalog and table units for charging out materials and using the Resource Directory.

IV. Work/Staff Room--120 square feet

To be located immediately behind the circulation desk and directly accessible from it. A door from it should be available to serve as a delivery and staff entrance and an emergency exit. It is the work area for behind-the-scenes tasks which have to be accomplished by

the staff, and additionally serves as a lunch and rest area for the staff away from the public. This area will provide the only storage in the library and must be utilized for that purpose to the greatest possible extent.

Main electrical panels should be located in this area; an exhaust fan would be desirable.

To be included in the general contract are the following cabinets, counters, and work stations for the staff:

--A single sink set in a counter with storage cupboards below and above. Must have electrical outlets easily accessible.

--A desk-height work station with knee hole and some drawers, including one letter-size file drawer. Cabinet above. Adjacent to desk area should be a typing area with electrical outlet.

--A closet for staff coats, purses, etc.

--A janitor's closet with space for vacuum cleaner and cleaning supplies.

Space should be provided for at least 3 sections of wall shelving. Additionally, access to the book return must be allowed for.

V. Washrooms (2)--80 square feet

Easily supervisable from the circulation desk. Fixtures as vandal-proof as possible. One of the washrooms must meet the code for use by the handicapped. Wall finish to be of easily cleanable material to ceiling height. Must have exhaust fan.

VI. Mechanical--40 square feet

Access could be from work/staff room. Heating and cooling equipment located here, if necessary.

Public Area:		
Adult		1,210 square feet
Juvenile		400 square feet
Circulation Area		150 square feet
Work/Staff Room		120 square feet
Washrooms (2)		80 square feet
Mechanical		40 square feet
	TOTAL	2,000 square feet

GENERAL REQUIREMENTS 0100-1

0100.1 Scope

This section includes labor, materials and equipment required to complete General Requirements indicated.

0100.2 Summary of Work

The work to be performed under this contract includes the construction of A BUILDING OF APPROXIMATELY 2,000 SQ. FT.

Item I Basic Unit 25 feet wide
Item II Alternate Unit 38 feet wide

0100.3 Standards

The completed buildings shall comply with the following codes and standards:

Washington State Factory Built Housing and Commercial Structures Law
Uniform Building Code
State Department of Environmental Health
National Electric Code
State Safety and Fire Codes
Minimum Property Standards F.H.A. 300, as amended
American Standards Specification: Accessible, Usable by Physically Handicapped

Provisions of these codes and standards are minimum requirements, and nothing in the Contract Documents shall be interpreted as permitting work not conforming thereto.

0100.4 As-built Records

The Contractor shall keep an accurately marked job set of prints as the job progresses, with all changes or deviations from the original drawings, if any, covering the work under his contract. Accurate measurements of all services and utilities should note changes of directions and locations, by dimensions and elevations, as the utilities are actually

installed. Upon completion of the project and before final acceptance provide one (1) set of blue line as-built prints.

RAMPS & WALKS 0260-1

0260.2 Standards

Ramps and walks shall comply with the following standards:

F.H.A. 200, "Minimum Property Standards"
American Standards Specifications: Accessible, Usable by Physically Handicapped.

BUILDING INSULATION 0720-1

0720.3 Blanket Insulation

Provide insulation for exterior walls, roofs and floors of building as follows:

Roof:	foil-back glass fiber blanket	R-19 (nom. 6")
Walls:	foil-back glass fiber batts	R-11 (nom. 4")
Floors:	foil-back glass fiber blanket	R-11

SHINGLES 0730-1

0730.3 Roofing

Roofing shall be 300# thick butt asphalt shingles with 15# felt base sheet.

Provide twenty-five (25) year guarantee per manufacturer's printed literature.

Provide positive drainage slope on roof surface to edge guttering or outlets.

SHEET METAL WORK 0760-1

0760.3 Workmanship

Provide all gutters, flashings, counter flashings, scuppers, downspouts, fascias, joint covers and all other sheet metal items required for a water-tight and weather-tight installation.

TOILET ACCESSORIES 1080-1

1080.2 Standards

Toilet accessories shall meet the requirements of the following standards:

State Department of Environmental Health
F.H.A. 300, "Minimum Property Standards"
American Standards Specification: Accessible, Usable by Physically Handicapped.

1080.3 Items

Soap dispenser--West Disinfecting Co., Tip Soap Dispenser #510 or approved. One per lavatory.

Paper towel dispenser--surface type, white enamel, Crown-Zellerback #101 or approved. One per lavatory.

Paper holder--#7027, one per lavatory, Miami Carey or equal.

Surface vanity with mirror--1650-30, one per lavatory, Jensen Steller or equal.

CARPETS 1240-1

1240.4 Materials

Carpet and Pad: Comply with Federal Specification No. GSALC 001676, 2.4 density. 3/8" polyurethane foam cushion. Carpet to have metallic static protection fiber.

DRAPERY & CURTAINS 1250-1

1250.2 Standards

Drapery and curtains shall meet the requirements of the following standards:

State Safety and Fire Codes

1250.4 Materials

Drapery track: Wall mounted, baked enameled steel, Kirsch "Double Duty," with pulley set, cord operator, draw cord.

Drapery: Glass fiber or 100% modacrylic fabric. Meet requirements of NFPA Standard 701. Light colored, tight weave, ASHRAE Shading Coefficient 0.44.

PLUMBING 1520-1

1520.2 Standards

Plumbing shall meet the requirements of the following standards:

State Department of Environmental Health
F.H.A. 300, "Minimum Property Standards"
American Standards Specification: Accessible, Usable by Physically Handicapped.

1520.3 Workmanship

Generally: Provide septic tank system and field; from lot line to existing off-site systems is not in contract except if agreed to as an extra to the contract amount.

HEATING, VENTILATING, AIR CONDITIONING 1580-1

1580.2 Standards

Heating, ventilation and air conditioning shall meet the requirements of the following standards:

Uniform Mechanical Code
F.H.A. 300, "Minimum Property Standards"
A.R.I. Certification Standards No. 240

1580.4 Materials

All materials shall be new, of first-class quality and shall be suited to the application. Fuel firing or electrically operated equipment shall be approved and listed by the NBFU, UL or appropriate regulatory authority and installed in compliance with the applicable rules. Unless otherwise approved, all materials shall be manufactured in the United States. Basic bid shall be Carrier Co. Heat Pump System including Unit 50 DQ 006. (5T)

APPENDIX B

CAPITAL EXPENDITURES
South Mason Facility
Fall, 1974

EXTERIOR

I. SIGN

timberland south mason library

letters 7" to 10" high, roman type face
routed on three 8' x 1' panels
gold lettering, dark brown background

ordered 10/15/74 for installation
10/31/74 by Signs by Lindy (Ralph
Lindberg, Olympia) $378.00

II. RURAL LETTER BOX

extra large size 13.60

III. BOOK RETURN w/depressible book truck

HIGHSMITH 65-366; Color: sand beige
Lettering on front panel: TIMBERLAND REGIONAL
LIBRARY 215.00

INTERIOR

I. VACUUM CLEANER

HOOVER upright, from Harold's, Olympia 63.00

II. FOLDING STEP STOOL

SEARS #11 H7032L; 29" high

III. BATTERY-POWERED WALL CLOCK

from Bigelow's 19.00

IV. FIRE EXTINGUISHERS

one large water, one small chemical, from
Firesafe, Olympia 67.00

V. MEETING ROOM

a. TRAPEZOIDAL TABLES	
30" x 60", from the MART, Seattle	
2 at $59.00 each	$118.00
b. METAL FOLDING CHAIRS	
Color: tan, from the MART #162	
30 at $4.88 each (7/74)	146.40
30 at $5.90 each (10/74)	177.00
c. METAL CARTS for folding chair storage (capacity, 32 each)	
Color: tan, from the MART #CT-6	
1 at $79.88 (7/74)	79.88
1 at $92.00 (10/74)	92.00
d. METAL COAT RACK, double face	
Color: grey, from the MART #5946	69.00
e. CABINET WORK on east wall under window	
By agreement w/Chet Brooks, Shelton	209.99

VI. OFFICE

a. METAL DESK, walnut top, middle drawer, drawers on each side	
30" x 56" from the MART (partially used)	112.88
PD-60 and DCD-300	18.88
b. METAL DESK	
24" x 40" transfer from Olympia Library	------
c. TYPING TABLE, black and walnut top	
30" x 18" from the MART 3018G	48.44
d. LEDU DESK LAMP	
from the MART	15.95
e. SUSPENSION FILE	
2 drawer, legal-size	
black, from the MART 21	48.88
f. EXECUTIVE CHAIR	
black w/persimmon seat	
from the MART (used)	25.00
g. SIDE CHAIR	
black, from the MART (used)	19.88

h. STENO CHAIR
black, from the MART 302PB — $ 19.88

i. BUILT-IN SHELVING IN STORAGE CLOSET
by arrangement w/Chet Brooks, Shelton — 49.94

j. WALL SHELVING
4 sections, single-face, 5 high
from PICKERING INDUSTRIES, Tacoma — (cost included w/shelving item under CIRCULATION AREA)

k. CORKBOARD, anodized aluminum frame
SEARS 3ZX 66018N
36" x 48" — 12.99

l. TYPEWRITER, electric
from Brownings, Centralia (used) — 200.00 (est.)

VII. CHILDREN'S AREA

a. ROUND TABLE w/circular BENCH attached
40" diameter table; benches 10" deep
Danish teak w/naugahyde seat in mandarin orange
Constructed by special order by
MARTIN FURNITURE, Olympia — 410.00

VIII. STUDY AREA(S)

a. TRAPEZOIDAL TABLES
30" x 60", from the MART
2 at $59.00 each — 118.00

b. RECTANGULAR TABLES, walnut top, folding legs
30" x 72", from the MART 6019
3 at $55.00 each — 165.00

c. STACKING CHAIRS, black w/black cushion seat from the MART 8941
20 at $19.88 each — 397.80

d. OCCASIONAL CHAIRS
from WASHINGTON SCHOOL SUPPLY, Seattle
2 at $66.90 each — 133.80

e. OCCASIONAL TABLE
from WASHINGTON SCHOOL SUPPLY — 44.05

IX. CIRCULATION AREA

a.	CHARGING DESK built to specifications by MARTIN FURNITURE, Olympia one 8' x 2' section w/drawer and adjacent shelves one 4' x 2' section w/adjacent shelves	$605.00
b.	STOOL for charging desk from WAREHOUSE FURNITURE SALES, Olympia	52.45
c.	TYPING TABLE, black w/walnut top from the MART 3018G	48.44
d.	SHELVING from PICKERING INDUSTRIES, Tacoma Ceylon teak lamination over composition board 5/8", adjustable shelves	
	Island shelving for charging desk area: 2 sections, double face, 3 high, 10" deep	
	Island shelving for main library area: 6 sets of 4 sections, double face, 5 high, 10" deep	
	Wall shelving for office (see OFFICE)	
	Wall shelving for Main Children's area: 14 sections, single face, 4 high, 10" deep 10 sections, single face, 4 high, 10" deep	3,200.00 (est.)
e.	MAGAZINE RACK HIGHSMITH 68-543 Color: All spatter beige	84.10
f.	CASTERS for magazine rack HIGHSMITH 68-546	18.00
g.	PHONODISK HOLDER HIGHSMITH 61-290 (capacity: 150)	76.75
h.	NEWSPAPER STICK HOLDER HIGHSMITH 18-506 (holds 6 papers)	22.80
i.	PAPERBACK SPINNER, 84 pocket	on hand
j.	SUNSET book size SPINNER, 32 pocket LANE PUBLISHING CO.	75.00

k.	SUSPENSION FILE (Vertical) 4 drawer, legal size, black from the MART 41	$ 66.88	
l.	CATALOG TABLE w/CHAIR (study carrell type) MARTIN FURNITURE, Olympia.	115.00	
m.	BOOK TRUCKS GAYLORD 68 color: desert sand 2 at $104.00 each	208.00	
	GAYLORD 42 color: gold 3 at $68.00 each	204.00	
n.	16mm PROJECTOR, Bell & Howell, f/1.2 lens	510.00	
o.	SOUND FILMSTRIP PROJECTOR	255.00	
p.	Newcomb RECORD PLAYER EDT-15	76.45	
q.	E-Z PACK LISTENING CENTER E-Z 6 (6 headsets)	44.70	
r.	PROJECTION SCREEN Da-Lite Video A glass beaded	48.00	
s.	AV 4-Hi IE Adjustable Table 38" H x 18" D x 24" W	53.00	
		$9,295.32	$323.40
	TOTAL		$9,618.72

RELATED EXPENDITURE

To Bekins Moving and Storage, Olympia for professional services, 10/28/74 from 9:15 a.m. to 12:15 p.m. in moving furniture from Lacey to Shelton	$ 281.75

SOUTH MASON PERIODICALS

ALASKA

AMERICAN AIRCRAFT MODELER

AMERICAN HOME

CONSUMER REPORTS

CONSUMERS' RESEARCH

CORONET

COUNTRYSIDE & SMALL STOCK JOURNAL

GOOD OLD DAYS

HOT ROD

LOGGERS WORLD

MOTHER EARTH NEWS

NATIONAL GEOGRAPHIC

NEWSWEEK

ORGANIC GARDENING

OUTDOOR LIFE

PACIFIC WILDERNESS JOURNAL

POPULAR ELECTRONICS

POPULAR MECHANICS

POPULAR SCIENCE

PSYCHOLOGY TODAY

RANGER RICK

RELICS

SEVENTEEN

SPHERE

SPORTS ILLUSTRATED

SUNSET

TRUE

WESTERN HORSEMAN

WORKBASKET

APPENDIX C

STATE OF WASHINGTON--DEPARTMENT OF LABOR AND INDUSTRIES
FACTORY-BUILT HOUSING SECTION

LISTED MANUFACTURERS

A.D. Grice
P.O. Box 661
Kirkland, WA 98033
(206) 743-5515

Alcoa Const. Systems, Inc.
Housing 601 Division
7819 S. 196th
Kent, WA 98031
(206) 852-4980

Bendix Home Systems, Inc.
1801 Orchard Ave.
P.O. Box 178
McMinnville, OR 97128

Bermar, Inc.
7951-2nd Ave. S.
Seattle, WA 98108
(206) 767-0196

Boise Cascade
Kingsberry West Div.
P.O. Box 518
Post Falls, ID 83854
(208) 873-4558
and
P.O. Box 1338
Eugene, OR 97401
(503) 342-6326

Celestial Homes
P.O. Box 287
Chewelah, WA 99109
(509) 935-6472

Century Bldg. Systems, Inc.
1750 West 5th Street S.
Salt Lake City, UT 84104
(801) 359-7649

Clover Park Educational Center
4500 Steilacoom Blvd. S.W.
Lakewood Center, WA 98499
(206) 584-7611, Ext. 340

Custom Comp. Structures, Inc.
P.O. Box 896
Preston, WA 98050
(206) 392-6483

D & M Wood Products
11320 N.E. Marx
Portland, OR
(503) 252-1473

Evergreen Modular Homes, Inc.
7028-27th St. West
Tacoma, WA 98466
(206) 564-5000

Grant & Grant Const. Co.
Box 974
Juneau, AK
Washington operations:
Building 224
Paine Field
Snohomish County
Everett, WA 98201
(206) 743-5515

Golden West Mobile Homes
2500 S. Walnut
Albany, OR 97321
(714) 547-8393 (Calif. office)

Grizzly Manufacturing
P.O. Box 1070
Hamilton, MT 59840
(406) 363-2387

Hansalex Enterprises
215 Dike Access Road, Box F
Woodland, WA 98674
(206) 244-1619

Keymark Industries, Inc.
2011-1/2 Madison
P.O. Box 4151
Everett, WA 98201
(206) 353-1906

Laird Construction
Rt. 2, Box 2222
Gig Harbor, WA 98335
(206) 858-9298
and
P.O. Box 518
Ephraim, UT 84627
(801) 283-4635

Mansfield Enterprises, Inc.
Rt. 1, Box 1058
Spanaway, WA 98387
(206) 847-2257

Marlette Homes, Inc.
400 W. Elm
Hermiston, OR
(503) 567-5546

Mobile Modules N.W., Inc.
P.O. Box 525
Seattle, WA 98111
(206) 624-6820, Ext. 506

Modular Pacific Corp.
9407 E. Marginal Way S.
Seattle, WA 98108
(206) R03-8710

Person and Person, Inc.
13410-8th St. East
P.O. Box "B"
Sumner, WA 98390
(206) 863-4408

Seattle Public Schools
Occupational Education
Task Force
2515 Boylston Ave. E.
Seattle, WA 98102
(206) 587-4282

St. Regis Fabricated Structures
733 East 11th
Tacoma, WA 98401
(206) 383-1861

Universal Struct. Comb., Inc.
3702 Colby
Everett, WA 98201
(206) 259-1011

Western Modular
9427 S. 212th
Kent, WA
(206) 854-5410

Merritt Equipment Co.
11150 N. Union Ave.
Portland, OR 97217
(503) 285-5293

T.E.I. Enterprises
334 Thain Rd.
Lewiston, ID 83501
(208) 743-4487
Harold Covey

Western Modules
1200 Mt. Hood Hiway, P.O. Box 82
Sandy, OR 97055
(503) 668-5561

Prot-A-Built Space Systems, Inc.
P.O. Box 525
Pasco, WA 99301
(509) 542-7773

Pre Built Structures
815 N. Hamilton
Spokane, WA
(509) 484-1500

Tension Structures, Inc.
9800 Ann Arbor Rd.
Plymouth, MI 48170
(313) 455-5800

Bellevue Public Schools
310-102nd Ave. N.E.
Bellevue, WA 98004
(206) 455-6000
Roger Wing

Designed Mobile Systems, Inc.
P.O. Box 367
First & Orange Streets
Patterson, CA 95363
(209) 892-6298

Westminister Homes, Inc.
221 Webber St.
P.O. Box 50
The Dalles, OR 97058
(503) 298-5124

ML-1 Newport High
4333-128th Ave. S.E.
Bellevue, WA 98006

APPENDIX D

A MONTHLY MAINTENANCE FORM FOR BOOKMOBILES

In determining the costs of operating bookmobile service, several difficulties arose. First, a review of existing literature revealed mileage costs that differed by as much as 10-fold (5,7). This data was also combined into categories which made ascertaining the basis for the variability difficult or impossible. Secondly, many of the libraries operating bookmobile service, which were contacted during this project, could not provide the breakdown on costs necessary to meet our needs on this project. We therefore propose a monthly record sheet (see Figure 11), which would provide a uniform system of records, minimum time to fill out, and, in addition, provide management a means of determining replacement requirements.

Figure 11

MONTHLY MAINTENANCE RECORD

Month & Year ___/___

Vehicle characteristics: Make _____ Year _____ Size _____

Date	Gas (gal.)	Oil, lube and gen. maintenance[a]	Mechanical overhauls	Structural repairs	Misc. costs[b]	General comments[c]
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
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21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						

[a]This includes tuneup and other regular maintenance costs.

[b]This includes any costs such as propane for heat, road service, etc.

[c]This column should include lists of items in misc. costs which were larger than usual or unusual in nature. It also would provide a space for the driver's comments on general conditions and/or problems with the vehicle.

Ending mileage _____

Beginning mileage _____

Month's mileage _____

APPENDIX E

CITIES AND TOWNS NOT INCLUDED IN MOD SERVICE

Adams County

Othello
Ritzville

Asotin County

Clarkston
Asotin

Benton County

Benton City
Kennewick
Prosser
Richland

Chelan County

Cashmere
Chelan
Leavenworth
Wenatchee

Clallam County

Forks
Port Angeles
Sequim

Clark County

Battle Ground
Camas
Ridgefield
Vancouver
Washougal

Columbia County

Dayton

Cowlitz County

Castle Rock
Kalama
Kelso

Cowlitz (cont.)

Longview
Woodland

Douglas County

Bridgeport
Waterville

Ferry County

Republic

Franklin County

Connell
Pasco

Garfield County

Pomeroy

Grant County

Ephrata
Grand Coulee
Moses Lake
Quincy
Soap Lake
Warden

Grays Harbor County

Aberdeen
Cosmopolis
Elma
Hoquiam
McCleary
Montesano
Ocean Shores
Taholah
Westport

Island County

Coupeville
Oak Harbor

Jefferson County

Port Townsend

King County

Algona
Auburn
Bellevue
Black Diamond
Bothell
Clyde Hill
Des Moines
Enumclaw
Issaquah
Kent
Kirkland
Lake Forest Park
Medina
Mercer Island
Normandy Park
North Bend
Pacific
Redmond
Renton
Seattle
Snoqualmie
Yarrow Point

Kitsap County

Bremerton
Port Orchard
Poulsbo
Winslow

Kittitas County

Cle Elum
Ellensburg
Roslyn

Klickitat County

Goldendale
White Salmon

Lewis County

Centralia
Chehalis
Packwood
Winlock

Lincoln County

Davenport
Odessa
Wilbur

Mason County

Shelton

Okanogan County

Brewster
Okanogan
Omak
Oroville
Tonasket
Twisp

Pacific County

Ocean Park
Raymond
South Bend

Pend Oreille County

Newport

Pierce County

Bonney Lake
Buckley
Eatonville
Gig Harbor
Milton
Orting
Puyallup
Steilacoom
Sumner
Tacoma

Skagit County

Anacortes
Burlington
Mount Vernon
Sedro Woolley

San Juan County

Eastsound
Friday Harbor

Skamania County

Stevenson

Snohomish County

Arlington
Brier
Darrington
Edmonds
Everett
Granite Falls
Lake Stevens
Lynnwood
Marysville
Monroe
Mountlake Terrace
Mukilteo
Snohomish
Stanwood
Sultan
Woodway

Spokane County

Cheney
Deer Park
Dishman
Medical Lake
Millwood
Spokane

Stevens County

Chewelah
Colville
Kettle Falls

Thurston County

Lacey
Olympia
Tenino
Tumwater

Wahkiakum County

Walla Walla County

Waitsburg
Walla Walla

Whatcom County

Bellingham
Blaine
Ferndale
Lynden

Whitman County

Colfax
Palouse
Pullman
Tekoa

Yakima County

Grandview
Granger
Mabton
Selah
Sunnyside
Toppenish
Union Gap
Wapato
Yakima
Zillah

NOTE: The number of households per town equals the town population divided by the ratio of the number of households in that county to that county's population (1970 census).

The selection of towns and cities excluded from the total number of MOD households was based on the assumption that towns with populations of 900 or more (1970 census) require a library building. Towns of 700 to 800 population with an increase to, or near, 900 in 1974 were included in this group. In addition, some unincorporated towns were included due to identifiable populations (900 or more) and known "adequacy" of their present library. Some other incorporated or unincorporated communities with libraries will require further evaluation to determine their inclusion or exclusion, based on knowledge of their needs and/or condition.

APPENDIX F

LAND COSTS FOR LIBRARY BUILDINGS

Unless land is donated, there will be either lease or purchase costs for the site of any new library to be constructed. Leasing a site is an ad hoc act and the price is a matter of agreement between the involved parties that may not be related to other leases consummated in the same locale. For this reason, it seemed inadvisable to speculate about the outcome of lease negotiations for land in any of the instances in which a new library building was contemplated.

There is, however, a history of land sales accessible in the instances of Newport, Northport, and Quilcene that can be of some help in providing comparisons of local land costs, and there may be some point in commenting briefly on these three communities. (Neah Bay, as part of an Indian reservation, is probably not subject to the same commercial aspects as are the three towns named above. The Cusick-Usk area did not appear to have an accessible history of land sales. However, this is very near an Indian reservation, and perhaps subject to the same considerations, at least in part, as Neah Bay.)

Recent sales and negotiations in Newport suggested prices ranging from $1,500 per acre for land at the edge of town to $4,000 per acre for land in town.* In Quilcene, the cost of a 20,000 sq. ft. lot was given as ranging from $6,000 to $15,000,** and that of a 40,000 sq. ft. lot as about $22,000 for a lot in town with 300 feet of commercial frontage. (Quilcene does not have a city water supply, and the costs include wells.) In Northport, prices of $1,000 to $1,500 per lot were quoted*** for a lot large enough for a 3,000 sq. ft. structure.

Clearly, the purchase of land for a library, if it becomes necessary, is a matter of agreement between buyer and seller. These costs cannot be taken as definitive, but must be regarded as the educated assessments of knowledgeable people on the scene, based upon past history.

* Source: Newport Realty. These prices are based on land sales recently made for an apartment house.

** Source: Endicott Realty

*** Source: Kettle Falls Realty